MCEN 4173/5173: FINITE ELEMENT ANALYSIS

HOMEWORK #5: Meshing Complex Geometries
Due on Friday, October 6th, 2006

Turn in the following:

1. Mesh pictures from the tutorial.

2. Problems 2-2 and 2-5 from your textbook.

Guidelines:

Create a mapped mesh for both problems. Remember to utilize symmetry in your model. Use the techniques from this laboratory session to create a quality mesh surrounding the holes in the model. Be sure that your mesh is adequately refined to capture the stress gradients near the hole.

Answer all questions asked in the text. In a discussion of the two problems, state the maximum deformation and maximum stress in each model. Indicate the location of those cases.

Compare the results from problems 2-2 and 2-5 with 2-1. Determine the percent stress reduction from problem 2-1 to your design in problem 2-5.

Use metric units. For the material properties of Aluminum, assume the material is Al 7075-T6.

Follow the standard laboratory report format. Specify geometric and material properties. Specify element type and boundary conditions. Include a picture of your mesh for each problem.

Make sure to turn in the two pictures of your mesh from the tutorial.